

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Chongqing Yanmei Technology Co., LTD

Petitioner

v.

TERVES, LLC

Patent Owner

Case No. IPR2023-00521

Patent No. 10,689,740

Issued: June 23, 2020

Application No.: 16/158,915

Filed: Oct. 12, 2018

Title: GALVANICALLY-ACTIVE IN SITU FORMED PARTICLES FOR
CONTROLLED RATE DISSOLVING TOOLS

**PETITIONER'S SUR-REPLY TO THE PATENT OWNER'S REPLY
TO PETITIONER'S OPPOSITION TO PATENT OWNER'S
CONTINGENT MOTION TO AMEND**

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TABLE OF AUTHORITIES

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PETITIONER'S CURRENT EXHIBIT LIST

Exhibit	Short name	Description
EX1001	'740 patent	U.S. Patent 10,689,740 B2
EX1002	'653 patent	U.S. Patent 10,329,653 B2
EX1003	'653 reexamination certificate	U.S. Patent 10,329,653 C1 (REEXAMINATION CERTIFICATE)
EX1004		Claim listing of claims 1-81 of the '740 patent
EX1005	Doud '838	Doud '838 is the US Publication No. US 2015/0299838 A1. Doud '838 is the publication of US Application No. 14/689,295. The present '740 patent is a continuation-in-part of US Application No. 15/641,439 upon which the '653 patent was granted, and which in turn is a divisional of US Application No. 14/689,295.
EX1006	Xiao '271	Xiao '271 is Chinese Publication No. CN 103343271 A to Xiao et al. The supplied English Language translation will be referred to and Petition submits that this translation is accurate and certified. Further Xiao '271 was cited in Ex Parte Reexamination Request for No. 90/014,795 (Reexamination of 10,329,653). Further the USPTO reexamination examiner referred to Xiao as

		the closest prior art in the Notice of Intent to Issue a Reexamination Certificate of 3/28/2022 in the ‘795 Reexamination.
EX1007	Xu ‘185	Xu ‘185 is the US Publication No. US 2013/0299185 A1.
EX1008	‘795 reexamination request	Reexamination No. 90/014,795. Request for reexamination of 10,329,653 B2 (7/6/21).
EX1009	’795 notice	Notice of Intent to Issue a Reexam Certificate (3/28/22)
EX1010		<i>Docket Report for Magnesium Machine LLC v. Terves LLC</i> , No. 5:21-cv-01115 (W.D. Oklahoma)
EX1011		<i>Partial Docket report for Terves LLC v. Yueyang Aerospace New Materials Co. Ltd</i> , 1:19-cv-01611-DCN (N.D. Ohio)
EX1012		<i>Docket Report for Terves LLC v. Yueyang Aerospace New Materials Co. Ltd</i> . No. 22-1855 (Fed. Cir.)
EX1013		Magnesium Machine LLC v. Terves LLC., <i>Complaint for Declaratory Judgement and Non-Infringement</i> filed 11/23/21
EX1014		Terves LLC vs. Yueyang Aerospace New Materials Co., Ltd., et al., <i>Memorandum in Support of Defendant’s Motion for Summary Judgment</i> , filed 11/18/2021.

EX1015		Notice of Allowance and <i>Examiner's Reasons for Allowance</i> dated 4/02/2020 in Application 16/158,915 which issued as the '740 patent.
EX1016	Nava Declaration	Declaration under 37 CFR 1.68 of Dr. Juan C. Nava, Ph.D.
EX1017		<i>Curriculum vitae</i> of Dr. Juan C. Nava
EX1018	PTAB SOP	Patent Trial and Appeal Board, Standard Operating Procedure 2 (Revision 10). Undated.
EX1019	IPR CRS Report	Inter Partes Review of Patents: Innovation Issues, Congressional Research Services Report R44905. July 26, 2017.
EX1020	FR critical minerals	2022 Final List of Critical Minerals, 87 F.R. 37, 10381-82. February 24, 2022.
EX1021	Fripp	U.S. Patent No. 9,759,035 to Fripp et al. filed March 6, 2014
EX1022		Email chain between parties' counsel

I. INTRODUCTION

In the Patent Owner's Reply (Paper 26 at 1), the Patent Owner concludes that in the Institution Decision (Paper 14 at 13) the Board has determined that claims 76-81 were entitled to the benefit of the filing date of Doud and Doud is not prior art to these claims. Furthermore, the Patent Owner contends that the claims are definite and would be reasonably understood by a POSITA, and that the Petition has not met the burden of persuasion to demonstrate unpatentability. (See Paper 26 at 2).

In response, Petitioner has carefully reviewed the Institution Decision (Paper 14). And in the Institution Decision (Paper 14 at 15), the Board is unable -- at that time -- to identify the dispute regarding the written description support for the recited levels of copper, nickel, and cobalt in claims 76-81, and so the Board believes that these claims are entitled to the benefit of the filing date of Doud and the Board chooses not to apply Doud as prior art against claims 76-81. However, the Board still indicates "... the proper construction of claims 76-81 is an open question that the parties are encouraged to further address during trial." (Paper 14 at 15). Petitioner believes that the determination of the Board regarding claims 76-81 within the Institution Decision is not a final written decision on the merits, but is a provisional determination of the Board based on the arguments as best understood by the Board at the time of drafting the Institution Decision. Petitioner believes that the fact that the proper construction of the claims 76-81 is left as an open question

(Paper 14 at 15) means the Board's determination regarding support for claims 76-81 vis-à-vis Doud was not final. Accordingly, herein Petitioner has explained more fully why Doud does not provide support for claims 76-81 more fully in the Petitioner's Reply (Paper 25) to the Patent Owner Response which is that the claims using the limitation "... said additive material includes one or more metal materials..." of claims 76-81, where the use of multiple additives implies a range which exceeds the additive range found in the Doud '838 (EX1005).

Therefore, the Petitioner believes that there is still a legitimate dispute regarding whether claims 76-81, upon which the Patent Owner's contingent motion to amend is based, have proper support in the manner required by 35 USC 112(a) in Doud '838 (EX1005) and whether Doud '838 constitutes prior art against the present '740 Patent.

Additionally, Petition responds to new issues raised in the Patent Owner's arguments regarding issues under 35 USC 112(b)/(d) and explains why the claims are still indefinite under 35 USC 112(b) or fail to further limit under 35 USC 112(d).

II. The proposed claims 104-163 are indefinite under 35 USC 112(b) and/or fail to further limit under 35 USC 112(d)

A. In claim 104, the terms "said magnesium composite includes in situ precipitate" and "said dissolvable magnesium cast composite includes in

situ ... precipitate ..., said in situ galvanically-active intermetallic precipitate includes the additive material” recited in claim 104 are vague and ambiguous. Proposed claims 105-163 suffer from the same ambiguity.

Beginning on page 2 of the Patent Owner Reply (Paper 26 at 2), the Patent owner tries to characterize the discrepancy between terms *in situ precipitate* and *in situ galvanically-active intermetallic precipitate* as effectively amounting to “an objection of antecedent basis.” The Patent Owner then attempts to show that the term “in situ precipitate” is further qualified as including “in situ galvanically-active intermetallic precipitate to enable controlled dissolution of the magnesium alloy.” The Patent Owner suggest that a POSITA would readily understand that the terms “in situ precipitate” and “in situ galvanically-active intermetallic precipitate” as progressive terms referring to the same thing.

However, Petitioner traverses this argument made by the Patent Owner. The ‘740 patent specification does not provide sufficient clarity on how the scope of the claim should be interpreted. As is briefed in the Opposition (Paper 24 at 3-4), the terms could be construed as referring to the same additive or to different additives or components. In light of the specification, it is not clear at all that the two different terms “in situ precipitate” and “in situ galvanically-active intermetallic precipitate” refer to the same thing. And, if they did in fact refer to the same thing, then it is questionable why the Patent Owner did not simply use the same term to refer to the

same thing throughout the claim, when Patent Owner had the opportunity to do so under the IPR Motion to Amend procedures.

Therefore, claim 104 is indefinite under 35 USC 112(b) because claim 104 recites both the limitations of “said magnesium composite includes in situ precipitate” and “said dissolvable magnesium cast composite includes in situ galvanically-active intermetallic precipitate to enable controlled dissolution of the magnesium alloy, said in situ galvanically active intermetallic precipitate includes said additive material”.

Proposed claims 105-163 depend from claim 104 and are therefore indefinite under 35 USC 112(b) for the same reasons and for failing to resolve the ambiguity.

B. In claim 104, the terms “dissolvable magnesium cast composite” and “magnesium composite” are indefinite under 35 USC 112(b). Claims 105-111, 114-116, 125-127, 132-138, 141-144, 146-149, 152-155, and 158-161 suffer from the same ambiguity.

Beginning on page 4 of the Patent Owner Reply (Paper 26 at 4), the Patent Owner indicates that “... Petitioner answered its own question by citation.” And the Patent Owner concludes that the ‘740 discloses embodiments where magnesium is present in at least 50 wt % and embodiments where it is not. (Paper 26 at 4-5) So, even after Patent Owner’s reply there is still no clear standard for determining whether any given composite which includes some magnesium is or is not

considered a magnesium composite within the meaning of the claim. It is not clear what limitation on claim scope the term “magnesium” provides. For instance, given the disclosure and further in view of Patent Owner’s arguments, a POSITA would not know to a reasonable degree whether the limitation “magnesium” is met with only impurity levels of magnesium, trace amounts, or even a single magnesium atom because in the Reply (Paper 26 at 4-6), the Patent Owner is arguing for a claim scope where the lower limit of magnesium could be one atom, which calls into question whether the Patent Owner has enabled such a broad scope of claim coverage.

Therefore claim 104 is indefinite under 35 USC 112(b) because it is unclear what minimum concentration of magnesium is required for the composite to be considered a “magnesium composite” within the meaning of the claims. Proposed claims 105-111, 114-116, 125-127, 132-138, 141-144, 146-149, 152-155, and 158-161 depend from claim 104 and are therefore indefinite under 35 USC 112(b) for the same reasons and for failing to resolve the ambiguity.

C. In claim 105, the limitation “said additive materials includes one or both of said nickel and said copper” renders it unclear whether claim 105 is intended to be exclusive of the inclusion of cobalt and therefore what upper boundary limits of nickel, copper, and possibly cobalt are covered by claim 105. Claims 107, 109, 111, 115, 125, 126, 136, 137, 142, 143, 147, 148, 153, 154, and 160 suffer from the same ambiguity by virtue of dependence.

Beginning on page 6 of the Reply (Paper 26 at 6) the Patent Owner concludes that claim 105 covers embodiments with and without cobalt. But the claim restricts. Here, Patent Owner's interpretation of proposed claim 105 runs contrary to the determination of the Board regarding a similar issue when using the term "consisting of" in a Markush group, which the Board determines "... creates a strong presumption that claim element is 'closed' and therefore 'excludes any element, steps, or ingredients not specified in the claim.'" (Institution Decision, Paper 14 at 14, quoting *Multilayer Stretch Cling Film Holdings, Inc. v. Berry Plastics Corp.*, 831 F.3d 1350, 1358 (Fed. Cir. 2016) (quoting *AFG Indus., Inc. v. Cardinal IG Co., Inc.*, 239 F.3d 1239, 1245 (Fed. Cir. 2001)). Because the claim 105 is limiting the enumerated elements of the Markush Group, which is itself exclusive under *Multilayer Stretch*, it is not clear whether the limited group of *said nickel* and *said copper* is exclusive of cobalt or not. The fact that the Patent owner simply states it is clear that the claim covers embodiments which include cobalt so long as one or both of copper and nickel are present is not sufficient because the issue involves a claim construction issue, which is a matter of law (See *Markman v. Westview Instruments, Inc.*, 517 U.S. 370 (1996)), and therefore cannot be decided contrary to *Multilayer Stretch* even if the Patent Owner would stipulate to such.

Accordingly, claim 105 is indefinite under 35 USC 112(b) because it is unclear whether the additives are exclusive of cobalt or not and what the overall maximum

range of additives are. Proposed claims 107, 109, 111, 115, 125, 126, 136, 137, 142, 143, 147, 148, 153, 154, and 160 depend from claim 105 and are therefore indefinite under 35 USC 112(b) for the same reasons and for failing to resolve the ambiguity.

D. The scope of claim 118 is indefinite and does not further limit the subject matter of the parent claim because the recited dissolution rates are outside the scope of the dissolution rate recited in parent claim 106.

Beginning on page 7 of the Reply (Paper 26 at 7), the Patent owner indicates that claim 118 is necessarily narrower than 106 and because claim 118 and 106 each recite the same dissolution rate that claim 118 is not irreconcilable with claim 106. In response, claim 106 recites a specific dissolution rate of 40 mg/cm²/hr in an environment of 3 wt% KCl water mixture at 90C. (See Paper 26 at A-2). It is agreed that claim 118 recites this specific dissolution rate as option a). However, claim 118 then goes on to list other alternative dissolution rates of 45, 75, 84, 100, and 110 mg/cm²/hr all at the same environmental conditions of 3 wt% KCl water mixture at 90C. The dissolution rate in a specific environment is a property of the composite. It is simply illogical that given the same environmental conditions of 3 wt% KCl water mixture at 90C different dissolution rates would be achieved because a composition and its properties are inseparable. *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). Additionally, if the composition is dissolving at a rate of 110 mg/cm²/hr in 3 wt% KCl water mixture at 90C environment, then by

definition it is not dissolving at the rate of 40 mg/cm²/hr in the environment and therefore the scope of claim 118 falls outside the scope of parent claim 106.

The additional dissolution rates recited claim 118 fall outside of this scope of claim 106. Therefore, claim 118 is invalid under 35 USC 112(d) and/or 35 USC 112(d) because claim 118 fails to further limit the subject matter of the parent claim 106 which also causes the scope to be unclear.

E. In claims 119-134, it is not clear whether the claim scope is limited to the magnesium alloy alternative, or whether the claims only limit the magnesium alloy if present.

Since a dependent claim is construed to incorporate by reference all of the limitations of the claim from which it refers, see 35 USC 112(d), it is unclear whether the Patent Owner's attempt to limit only the scope of the magnesium alloy alternative means that claims 119-134 is exclusive of the magnesium metal alternative, or whether these the claims define the magnesium alloy only if present. The arguments made by the Patent Owner in the Reply (Paper 26 at 8) fail to address this. The Patent owner indicates that the magnesium alloy must be present, but it is not clear whether this can be in addition to magnesium metal or not.

Therefore, claims 119-134 are invalid under 35 USC 112(b) because it is unclear whether these claims are exclusive of pure magnesium *per se* being added or not; and the scope of the concentration ranges are unclear without knowing

whether the cast composite of 119-134 includes additional pure magnesium.

F. In claims 136, 137, 142, 143, 153, 154, and 160 the scope of the claims is not clear because parent claim 105 requires at least 85% magnesium in the composite, whereas the upper additive boundary recited in these dependent claims is greater than 15% and therefore is ambiguous under 35 USC 112(b) and/or fails to further limit the scope of the parent claim under 35 USC 112(d).

Beginning on page 9 of the Reply the Patent Owner argues *Ex Parte Sophie Viala et al.* and *In re Kroekel* as suggesting that when the claimed compositions read on including more than 100% by weight of the recited components that the claim is not rendered indefinite because a POSITA would be able to understand that a claim cannot cover impossible formulations due to considering upper range values for multiple component exceeding the natural limit of 100% by weight. However, this is not the issue here. For example, claim 105 requires at least 85% magnesium in the composite and then immediate dependent claim 136 sets an upper limit for the nickel of 23.5 wt % which is outside of the bounds set by parent claim 105. So, the scope of claim 136 is unclear as to whether the Patent Owner considers the upper boundary of nickel is 15% implied by parent claim 105 or is 23.5% as written. If the upper limit is 15%, then it raises questions as to why -- when having the opportunity to amend -- the Patent Owner chose to recite 23.5% instead of 15%. And if the upper limit is 23.5%, then this falls outside the scope of parent claim which implies an

upper limit of 15%.

Therefore, claims 136, 137, 142, 143, 153, 154, and 160 are invalid under 35 USC 112(d) indefinite under 35 USC 112(b).

G. Claims 162 and 163 are indefinite under 35 USC 112(b) and/or fail to further limit the parent claim as required under 35 USC 112(d).

Claims 162 and 163 fail, under 35 USC 112(d), to limit the subject matter of the parent claims 112 or 113 because the parent claim can be understood to require a maximum concentration of additives of 50 wt. %, and these claims cover a maximum concentration of additives of 79.5 wt. % which exceeds the implied 50 wt. % of additives. The weight percentages are not exceeding a natural maximum of 100% above which is impossible so *Ex Parte Sophie Viala et al.* and *In re Kroekel* are not analogous. Because each of these claims recites a new set of range limitations which apparently conflicts with the range of the parent claims 112 and 113, the scope of protection sought in claims 162 and 163 is ambiguous and therefore indefinite under 35 USC 112(b).

Therefore, claims 162 and 163 are invalid under 35 USC 112(d) and invalid under 35 USC 112(b).

III. The proposed claims 104-163 are anticipated under 35 USC 102 over Doud '838

Proposed claims 104-163 have a priority date of 10/12/2018 because support for the upper ranges of the additives where “said additive material includes one or more metals...” within the claimed ranges in claim 104-163 is not found in any parent application. Therefore, proposed claims 104-163 are anticipated by Doud ‘838.

The Patent Owner suggests that the issue has already been settled by the Board. However, Petitioner disagrees and traverses this assumption. The Patent Owner points out that limitations of exceeding 45 wt% or 50 wt% are not actually recited in the proposed claims (Paper 26 at 11). However, since the claims at issue contain ranges, the Petition was attempting to show the limits of the disclosure of the ‘653 Patent. In claim 1 of the ‘653 patent, the range for the additives is given as 0.05 wt %-45 wt % for the total concentration of the additives, and when the additives may be one or more of Cu, Ni, Fe, and Co. (See EX1002 pp. 16-19; ‘653 Patent, claims 1, 12, 41, and 49). There is simply no disclosure in ‘653 of additive amounts of between 45-50 wt. % or between 45-49.5 wt. % of the composite. And there is no disclosure in the ‘653 of the additives being over 35 wt. %, alone or together, when the available additives do not include iron (Fe) as part of the exclusively enumerated list. In fact, the range of total additives in the composite in the ‘740 patent was expanded versus the specification in the ‘653 patent by changing the disclosed of the total additive upper end point to include 49.5 wt. %. See Patent

Owner's Redline from '653 patent to '740 patent (See EX2019 p. 6). Accordingly, the fact that the claims now recite said additive material includes one or more metals..." which implies covering additives in a range above 45% is not supported by the disclosure of the '653 patent.

Because the disclosure of the '653 patent fails to provide support for the claims in the manner required by 35 USC 112(a) the claims at issue 76-81, upon which the present claims are based, the present proposed claims cannot be entitled to a priority date earlier than 10/12/2018. Therefore Doud '838 stands as prior art against the proposed claims and renders them unpatentable under 35 USC 102 for the reasons previously provided in Petitioner's Opposition (Paper 24).

IV. Conclusion

For the reasons given above, and the reasons presented in the Opposition to the Motion to Amend (paper 24), Petitioner requests that the Board deny granting of the Patent Owner's contingent motion to amend the claims in U.S Patent 10,689,740.

Respectfully Submitted,

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CERTIFICATE OF SERVICE

Under 37 CFR 42.6(E), the undersigned certifies that on May 07, 2024, a copy of the foregoing Petitioner's Sur-Reply to Patent Owner's Reply to Opposition to Patent Owner's Contingent Motion to Amend and all associated exhibits was served by E-mail on the Lead and Back-up Counsel for the Patent Owner:

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CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME
REQUIREMENTS UNDER 37 CFR 42.24

Under 37 CFR 42.24(d), the undersigned certifies that this Sur-Reply to Patent Owner's Reply to Opposition to Patent Owner's Contingent Motion to Amend complies with the type-volume requirements of 37 CFR 42.24(c) because it contains 12 pages and only 2,966 words, excluding the parts of the Su-Reply exempted by 37 CFR 42.24(c).

This Reply also complies with the typeface requirements of 37 CFR 42.6(a)(2)(ii) and type-style requirements of 37 CFR 42.6(a)(2)(iii) and (iv).

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